

APPENDIX D

WASTE MANAGEMENT, TRANSPORTATION, AND DISPOSAL PLAN

For the

BOMARC Missile Site Plutonium Remediation Project

McGuire Air Force Base
New Jersey

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1.0 SCOPE

1.1 Purpose

The purpose of this document is to establish procedures for the safe on-site management, transportation and disposal of waste and other unwanted materials by Duratek, and its subcontractors, for materials generated during the BOMARC Missile Remediation Project at McGuire AFB, New Jersey.

1.2 Applicability

This document is applicable to all material and waste management activities conducted for the BOMARC Missile Remediation Project.

2.0 REFERENCES

- 2.1 Title 49, Code of Federal Regulations, "Transportation",
- 2.2 Title 40, code of Federal Regulations, "Protection of Environment",
- 2.3 Title 10, code of Federal Regulations, "Energy",
- 2.4 Duratek/Chem-Nuclear Systems, BOMARC Missile Site Remediation Project Health and Safety Plan,
- 2.5 US Department of Transportation, "USDOT Emergency Response Guidebook" and
- 2.6 US Army Industrial Operations Command, "Shipping Procedures for Unwanted Radioactive Materials".

3.0 DEFINITIONS

For the purposes of this document, the following definitions are provided for the purpose of clarification:

- 3.1 Hazardous Material Broker - Any individual who is certified by the US Army Operations Support Command to:
 - 3.1.1 Arrange for transportation of the waste,
 - 3.1.2 Collect or consolidate shipments of waste; or,
 - 3.1.3 Process waste in some manner in preparation for final disposition.

NOTE: THIS DEFINITION DOES NOT APPLY TO AN INDIVIDUAL OR ORGANIZATION WHOSE SOLE FUNCTION IS TO TRANSPORT WASTE.

- 3.2 Low Level Radioactive Waste Compact - A group of states that have formed a compact, as defined by the Federal Low Level Radioactive Waste Policy Amendments Act, for the purpose of managing disposal of low level radioactive waste within the compact states.
- 3.3 Disposal Site - For the purposes of this procedure, any facility licensed for the purpose of disposing of low level radioactive waste, NORM and/or mixed waste.
- 3.4 Disposer - The site which receives radioactive or hazardous waste for disposal.
- 3.5 Envirocare of Utah - The Naturally Occurring Radioactive Material (NORM)/Mixed Waste/Low Level Radioactive Waste disposal facility, owned and operated by Envirocare of Utah, Inc., located in Tooele County, Utah.
- 3.6 Exclusive Use (also referred to in other regulations as "sole use" or "full load") means sole use by a single consignor of a conveyance for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. The consignor and the carrier must ensure that personnel having radiological training and resources appropriate for safe handling of the consignment perform any loading or unloading. The consignor must issue specific instructions in writing, for maintenance of exclusive use shipment controls, and include them with the shipping paper information provided to the carrier by the consignor.
- 3.7 Hazardous Materials - Any material which is determined by the Secretary of Transportation of the United States, to present a hazard when transported in commerce.
- 3.8 Hazardous Waste - Any waste which is defined as such by the United States Environmental Protection Agency (USEPA) under 40 CFR 261.
- 3.9 Low Level Radioactive Waste - Wastes containing source, special nuclear, or byproduct material that is acceptable for disposal at a low-level radioactive waste disposal facility.
- 3.10 Low Specific Activity (LSA) Material – LSA material means Class 7 (radioactive) material with limited specific activity that satisfies the descriptions and limits set forth below. Shielding materials surrounding the LSA material may not be considered in determining the estimated average specific activity of the package contents. LSA material must be in one of three groups:

3.10.1 LSA-I

- (i) Ores containing only naturally occurring radionuclides (e.g., uranium, thorium) and uranium or thorium concentrates of such ores; or
- (ii) Solid unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures; or
- (iii) Class 7 (radioactive) material, other than fissile material, for which the A_2 value is unlimited; or
- (iv) Mill tailings, contaminated earth, concrete, rubble, other debris, and activated material in which the Class 7 (radioactive) material is essentially uniformly distributed and the average specific activity does not exceed $10^{-6}A_2/g$.

3.10.2 LSA-II

- (i) Water with tritium concentration up to 0.8 Terabecquerel/liter (20.0 Ci/liter); or
- (ii) Material in which the Class 7 (radioactive) material is distributed throughout and the average specific activity does not exceed $10^{-4}A_2/g$ for solids and gases, and $10^{-5}A_2/g$ for liquids.

3.10.3 LSA-III

Solids (e.g., consolidated wastes, activated materials) that meet the requirements of §173.468 and which:

- (i) The Class 7 (radioactive) material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.); and
- (ii) The Class 7 (radioactive) material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that, even under loss of packaging, the loss of Class 7 (radioactive) material per package by leaching when placed in water for seven days would not exceed $0.1 A_2$; and
- (iii) The average specific activity of the solid does not exceed $2 \times 10^{-3}A_2/g$.

Note: A_2 for Plutonium 239 and 240 is 5.41×10^{-3} Curies.

3.11 Mixed Waste - Wastes containing materials which are, by definition, radioactive waste as defined by the United States Nuclear Regulatory

Commission (USNRC) and hazardous waste as defined by the USEPA.

- 3.12 NORM Waste - Wastes that contain only naturally occurring or accelerator produced radioactive materials. These materials are regulated by state law and are not low level radioactive waste.
- 3.13 Radioactive Material - Any material having a specific activity greater than 70 Bq per gram or 0.002 microcurie per gram (2,000 pCi/g).
- 3.14 Surface Contaminated Object (SCO) - A solid object which is not itself radioactive but which has Class 7 (radioactive) material distributed on any of its surfaces. SCO must be in one of two groups with surface activity not exceeding the following limits:

3.14.1 SCO-I - A solid object on which:

- (i) The non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 Bq/cm² (10⁻⁴ microcurie/cm²) for beta and gamma and low toxicity alpha emitters, or 0.4 Bq/cm² (10⁻⁵ microcurie/cm²) for alpha emitters;
- (ii) The fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 x 10⁴ Bq/cm² (1.0 microcurie/cm²) for beta and gamma and low toxicity alpha emitters, or 4 x 10³ Bq/cm² (0.1 microcurie/cm²) for all other alpha emitters; and;
- (iii) The non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 4 x 10⁴ Bq/cm² (1 microcurie/cm²) for beta and gamma and low toxicity alpha emitters, or 4 x 10³ Bq/cm² (0.1 microcurie/cm²) for all other alpha emitters.

3.14.2 SCO-II - A solid object on which the limits for SCO-I are exceeded and on which:

- (i) The non-fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 400 Bq/cm² (10⁻² microcurie/cm²) for beta and gamma and low toxicity alpha emitters or 40 Bq/cm² (10⁻³ microcurie/cm²) for all other alpha emitters;

- (ii) The fixed contamination on the accessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8 x 10⁵ Bq/cm² (20 microcurie/cm²) for beta and gamma and low toxicity alpha emitters, or 8 x 10⁴ Bq/cm² (2 microcuries/cm²) for all other alpha emitters; and;
- (iii) The non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm² (or the area of the surface if less than 300 cm²) does not exceed 8 x 10⁵ Bq/cm² (20 microcuries/cm²) for beta and gamma and low toxicity alpha emitters, or 8 x 10⁴ Bq/cm² (2 microcuries/cm²) for all other alpha emitters.

3.15 TSD Facility - A Treatment, Storage, or Disposal Facility as defined by the USEPA in accordance with Reference 2.2.

4.0 MATERIAL AND WASTE SOURCES AND CLASSIFICATION

This section describes the sources and classifications of the materials and wastes that may be generated during the remedial activities to be performed at the BOMARC facility.

4.1 Sources of Materials and Wastes

Implementation of the remedial action activities at the Site will result in the generation of materials and wastes that will require appropriate on-site and off-site management. These materials and wastes will be generated during the excavation of radiologically contaminated soil, decontamination and demolition of Shelter 204, as well as during the execution of associated support operations (i.e., equipment decontamination, sampling, etc.) The anticipated materials and wastes to be generated from the implementation of the remedial action activities include, but are not limited to:

Source	Potential Materials and Wastes
Contaminated Soil Excavation Activities	Radiologically contaminated soils and concrete (>8 pCi/g Pu 239/240) Radiologically contaminated soils and concrete (<8 pCi/g Pu 239/240) Water from excavation areas and surface run-off Spent PPE, debris, disposable equipment
Shelter 204 Activities	Radiologically contaminated soil (>8 pCi/g Pu 239/240) containing lead Clean debris (<NRC Regulatory Guide 1.86) Radiologically contaminated concrete (<8 pCi/g Pu 239/240) Surface contaminated construction debris Spent PPE, debris, disposable equipment
Decontamination activities	Decontamination waters Spent PPE, debris, disposable equipment
Other	Common trash and garbage (non-contaminated) Sanitary wastewater Waste oil (from filters, equipment maintenance)

4.2 Material and Waste Classifications

The primary material to be handled during the remedial action activities will be Low Specific Activity (LSA) material, Surface Contaminated Objects (SCO) and non-regulated material. The potential for encountering hazardous waste also exists. Analysis results for material and waste management characterization should be recorded on the Material and Waste Characterization Tracking Log, Appendix G. Each of these material and waste classifications are discussed in detail below.

4.2.1 Radiological Materials and Wastes

The primary contaminants are Pu-239, Pu-240, and their associated decay products. There is also a potential for encountering mixed wastes during the remediation.

Soils that contain radiological contamination above 2,000 pCi/g will be designated as LSA soils (LSA-1 or LSA-2 depending on the activity). Soil with radiological contamination below 2,000 pCi/g is not regulated by the U.S. Department of Transportation and will be transported based on the requirements of the disposal facility.

4.2.2 RCRA Hazardous Materials and Waste

Implementation of the remedial action activities may involve handling waste materials that are subject to the RCRA Hazardous Waste Regulations. A solid waste may be a RCRA hazardous waste if it is specifically listed as a RCRA Hazardous Waste, or if it exhibits any of the following characteristics of hazardous waste: ignitability, corrosivity, reactivity, and/or toxicity. The regulatory definitions for each of these

characteristics are contained in 40 Code of Federal Regulations (CFR) Part 261.21 through 261.24. Any wastes identified as being either RCRA Listed or Characteristic Hazardous Wastes must be managed in accordance with all applicable RCRA hazardous waste management regulations.

It is not anticipated that any listed wastes are present at the Site. Therefore, for the purposes of this plan, discussion will be limited to RCRA Characteristic Hazardous Wastes.

RCRA characteristic hazardous wastes are materials that exhibit ignitability (Hazardous Waste Code Drum 001), corrosivity (Hazardous Waste Code Drum 002), reactivity (Hazardous Waste Code Drum 003), and/or one or more of the toxicity characteristics (Hazardous Waste Codes Drum 004 through Drum 043). The hazardous waste characteristics are identified through laboratory analysis of waste materials or based on the waste generator's knowledge of the process generating the waste. As part of the Site Characterization Report, soil samples were collected for hazardous waste characterization. None of the soil samples collected from the surface and subsurface contained levels above the regulatory limit for hazardous waste. Therefore, hazardous waste will not be encountered during the excavation of the soil.

The sediments in the launch pit at the shelter will be removed and stockpiled separately. Based on historical investigation, the potential for lead contamination above the regulatory limit of 5 mg/l (TCLP) vice 5 mg/l exists which would cause the sediments to be hazardous. These sediments will be analyzed for lead to determine if concentrations are above 5 mg/l prior to packaging and off-site shipping.

Spent PPE, equipment, and materials that are contaminated with RCRA Hazardous Waste may themselves be classified as RCRA Hazardous Wastes based on the "Derived From" Rule. It is anticipated that personal protective equipment (PPE) generally will be classified as radiological waste, rather than RCRA Hazardous Waste, since most spent PPE will be generated during the removal and handling of radiological materials.

During the excavation and removal of the launch pit sediments, PPE will be kept separate from other PPE used at the site. If RCRA Hazardous Wastes are identified at the Site, spent PPE generated during the removal and handling of the sediments will be disposed along with the RCRA hazardous waste itself.

4.2.3 Mixed Materials and Waste

Mixed wastes are defined by the Low Level Radioactive Waste Policy Act, Public Law 96-573; this includes radioactive material not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined by Section 11.e(2) of the Atomic Energy Act, and contains hazardous waste that is either listed as a hazardous waste in Subpart D of 40 CFR 261 and/or exhibits any of the hazardous waste characteristics identified in Subpart C of 40 CFR 261, or hazardous waste which also contains naturally occurring radioactive materials. Encountering or generating mixed waste is not anticipated on this project.

4.2.4 Unregulated Materials and Wastes

In addition to the waste classifications identified above, remedial action activities may also result in the generation of waste materials that are not classified as radiological material or RCRA hazardous wastes but may contain hazardous substances requiring special management procedures (Regulated Wastes). Such Regulated Wastes may include the following:

- 4.2.4.1 Non-hazardous Contaminated Soils and Debris - Contaminated soils and debris that are not classified as radioactive material or RCRA hazardous wastes may be subject to restrictions for transportation, treatment, recycling, and/or disposal, depending upon the concentration of the contaminants present and the intended disposition of such materials.

4.2.5 Other Materials and Wastes

A variety of non-hazardous materials will likely be generated during remedial action activities that will also require proper management. These materials may include the following:

- 4.2.5.1 Construction Debris - This category includes material that has not been contaminated by radiological materials or otherwise impacted by hazardous substances or wastes. Clean debris may be used as on-site fill material or may be disposed of at a licensed off-site construction debris landfill.
- 4.2.5.2 Trash and Rubbish - This material includes spent packaging materials, equipment, and general garbage and trash that has not been impacted by radioactive or hazardous substances. Trash and rubbish will be stored on-site in appropriate containers and will be

disposed of at a licensed off-site municipal waste facility. A licensed local municipal waste hauler will transport this material to a municipal landfill.

5.0 REGULATORY REQUIREMENTS

5.1 Prerequisites

The following prerequisites must be met prior to any individual shipping or assisting in the shipment of waste by any conveyance on public property.

NOTE: All waste associated with the BOMARC project is owned solely by McGuire Air Force Base, and all shipping papers will identify McGuire AFB as the shipper.

- 5.1.1 The person performing activities associated with the shipment of hazardous, radioactive, or mixed waste shall be properly trained in accordance with the requirements of Reference 2.1, Part 172, Subpart H and will meet all qualification requirements of Reference 2.6.
- 5.1.2 The Broker performing shipments for the BOMARC Missile Site Remediation Project shall ensure that the following administrative requirements are addressed prior to any shipment of materials or wastes off-site:
 - 5.1.2.1 All materials being shipped from the project site or the railhead must be identified by the most appropriate Proper Shipping Name in accordance with the Hazardous Materials Tables of Reference 2.1, Part 172. Radioactive and mixed wastes being shipped for disposal or shipped to a collector or processor for eventual disposal must also be classified in accordance with Reference 2.3, Part 61 or a valid disposal site license, as appropriate.
 - 5.1.2.2 If hazardous or mixed waste materials are generated, these wastes must be identified by the most appropriate US EPA Waste Code in accordance with Reference 2.2.
 - 5.1.2.3 For any hazardous or mixed wastes generated, all notifications and certifications for waste material subject to the land disposal restrictions must be completed in accordance with Reference 2.2, Part 268.

- 5.1.3 The Broker shall ensure that all shipments of waste for treatment or disposal are prepared and shipped in compliance with the receiving facility's waste acceptance criteria.
- 5.1.4 Hazardous Materials not shipped as waste shall be shipped in such a manner as to conform to all federal, state and local ordinances. Material Safety Data Sheets for hazardous materials to be shipped shall be reviewed, if available, prior to any shipping related activities. Non-waste radioactive materials shall only be shipped to a facility upon provision of evidence, such as a valid USNRC license, that the material is acceptable at the receiving facility.

5.2 Tools, Materials, and Equipment

The Broker will ensure that all tools, administrative forms, survey instruments, labels, markings, and placards are available for each shipment of materials. Special care must be taken by the Broker to ensure that an adequate supply of such materials is maintained.

6.0 MATERIAL AND WASTE MANAGEMENT PROCEDURES

This section presents the specific guidelines and procedures that will be followed for the management of material and wastes handled during the remedial action activities at the BOMARC Site and at the railhead facility. These procedures are generally applicable to the management of wastes after they have been excavated/removed. Specific procedures for material and waste excavation and removal are presented in the Site Operations Work Plan. The procedures presented in this section are based on the project goals of minimizing threats to workers, human health, and the environment during all material and waste handling activities. Specific procedures and guidelines for visually characterizing, segregating, handling, staging, storing, sampling, packaging, labeling, and transporting material and waste are presented in the following sections.

6.1 General

Material and waste handling activities will be performed in a manner that minimizes the threat of a release of potentially contaminated material to the environment and surrounding community, and protects worker health and safety. Care will be taken during operations and activities that will generate materials and wastes, such as excavation, demolition, and dewatering, to prevent releases of material, waste, and dust to the surrounding environment.

6.2 Material and Waste Handling Precautionary Measures

The following steps may be implemented prior to or during remedial activities to ensure that there are no releases of material and/or waste to

the environment and surrounding community, and to protect workers.

- 6.2.1 Engineering controls such as water sprays may be used during activities that could potentially generate dust (i.e., excavation and loading of containers with waste) to prevent the spread of contaminants via wind dispersion.
- 6.2.2 Plastic sheeting may be placed under and around containers while they are being loaded with waste materials. Any material that falls onto the plastic sheeting during loading will be collected and placed in the container. In addition, the inside of steel intermodal containers will be lined with plastic sheeting.
- 6.2.3 Site workers will wear PPE appropriate for the specific task being performed, in accordance with the Site Health and Safety Plan. Spent PPE and contaminated disposable equipment and materials will be containerized and disposed of appropriately.
- 6.2.4 Equipment used during construction activities in potentially contaminated areas will be properly decontaminated before moving through clean areas of the Site or leaving the Site.
- 6.2.5 Truck transportation roads and the BOMARC site loading area will be surveyed for contamination prior to the commencement of work, periodically during excavation if needed, and at the end of the project, to verify that these areas have not been contaminated during material and waste handling operations. See section 3.4.9 of the Work Plan for details of surveys at the BOMARC Site and Attachment A of Appendix C, Sampling and Analysis Plan for details of the truck route and railhead surveys and soil sampling.
- 6.2.6 A staging area will be provided for filled waste containers, near the boundary of the Exclusion Zone. The staging area will be lined on the bottom and will be used for final decontamination and surveys of containers prior to loading on trucks. After surveys have confirmed that a container meets contamination limits, the container will be lifted out of the exclusion area using a crane, and placed on a truck for transport to the railhead. The staging area liner will be cleaned or replaced before another container is staged.

6.3 Pre-Excavation Screening

All materials and wastes to be excavated will be screened using appropriate radiation detection equipment. In addition, perimeter soil samples will be collected for on-site analysis to define the perimeter of the excavation based on a 5-meter grid. Materials containing >8 pCi/g Pu 239/240 will be segregated for off-site transportation. Materials

containing <8 pCi/g Pu 239/240 will be segregated for use as Site backfill.

6.4 Material and Waste Handling, Staging, and Storage

The guidelines that will be used for handling, staging, and storage of waste materials generated during the remedial activities at the BOMARC Site are presented below.

- 6.4.1 As radioactive contaminated soils are excavated, they will be transferred to the appropriate designated staging area or material preparation area for further management. The Site Operations Work Plan identifies the locations of the designated staging areas within the Exclusion Zone. Excavated soils will be segregated based on in-situ scanning results and on-site soil analytical results as they are being excavated.
- 6.4.2 Materials transported for disposal must not contain any free liquids and must pass the paint filter test. Therefore, any materials that are saturated upon excavation will be staged within the Exclusion Zone. Materials to be shipped will be sampled and the samples analyzed using the paint filter test to satisfy applicable disposal requirements. The staging area will be equipped with a sump to allow for collection of waters. These waters will be transferred to the on-site holding tank for treatment and reuse. The sump will be cleaned out, as necessary, to remove accumulated sediments. Cleaning of the sediment traps will be performed using hand tools and heavy equipment, as appropriate. Sediments removed from the sump will be stabilized, as necessary, and disposed of along with soils. Water that is used will be collected and tested for radioactivity in accordance with the Sampling and Analysis Plan, Appendix C.
- 6.4.3 The staging areas for non-radioactive (<8 pCi/g Pu 239/240) soils will be constructed within the exclusion zone as close as possible to the areas where remedial activities will occur.
- 6.4.4 Radioactive soils with an activity of >8 pCi/g Pu 239/240 shall be packaged in steel intermodal containers at the stockpile area, loaded on to trucks for transportation following the completion of the radiological screening and sampling/analysis procedures specified in the Sample and Analysis Plan (SAP). Soil and debris less than 2,000 pCi/g will be packaged in strong tight steel intermodal containers. Soil and debris greater than 2,000 pCi/g will be packaged and shipped in containers that meet the DOT requirements for IP-2 packages.
- 6.4.5 All trucks, excluding those dedicated to the exclusion area of the excavation site, will remain outside of the exclusion area. All

vehicles leaving the Exclusion Zone and trucks loaded with waste containers will be surveyed for total contamination and smeared for removable contamination prior to release. In the event that contamination is discovered, the vehicles will be decontaminated (at the equipment decontamination facility, if necessary) prior to release. See Section 3.4.6 of the Work Plan for details.

6.4.6 All hazardous materials and wastes generated at the BOMARC Site or the railhead will be stored in compliance with applicable state and federal law based on suspected or known contaminants. The following are general guidelines for the management of the soils:

- 6.4.6.1 The stockpiles of soil and debris will be sampled as required to meet the characterization data quality objectives specified in the Field Sampling and Analysis Plan and to meet the waste acceptance criteria of the disposal facility.
- 6.4.6.2 Chemically incompatible materials shall not be stored together.
- 6.4.6.3 Radioactive material stockpiles awaiting packaging or transport will be stored in a "Radioactive Materials Area" with yellow and magenta rope barriers or other physical boundaries and postings as specified in Reference 2.3 (with the exception noted in section 6.4.6.5). Stockpiled materials may not exceed 1000 cubic yards per stockpile.
- 6.4.6.4 Hazardous or mixed wastes, if identified, will be properly labeled at the beginning of their accumulation within a storage or disposal container. Labeling and storage requirements will be as specified in Reference 2.2 for interim storage of hazardous wastes. No hazardous waste will remain in storage for greater than 90 days after accumulation begins.
- 6.4.6.5 All waste entering Fort Dix or NAES Lakehurst will be attended by contractor personnel at all times until the loaded train is on the Conrail line headed to Envirocare.

6.5 Lakehurst NAES Rail Loading Area Operations

- 6.5.1 Empty rail cars will be moved onto NAES Lakehurst and staged at the railhead area adjacent to Hancock Road for loading of waste containers. Upon receipt of empty rail cars, direct surveys will be performed at a total of 10 locations, including points on

the bed and sides of the rail car that would most likely collect loose material or be contaminated. To assess removable contamination, smears will be obtained at 6 locations on rail car bed and sides, at locations with the highest direct readings. Results will be compared to the NAES Lakehurst limits in Table 3.2 of the Work Plan. If the limits are exceeded, the Duratek Project Manager shall be contacted immediately. The Duratek Project Manager will contact the Air Force, the Navy immediately and further action will be coordinated with the appropriate service. Unless the rail car can be easily decontaminated or NAES Lakehurst grants approval for use, the rail car will be rejected for use on the project and the Rail Company will be asked to remove the car.

- 6.5.2 Trucks, which contain loaded steel intermodal containers from BOMARC, will travel along the AT&T Access Road until they enter Lakehurst NAES through the Route 539 gate along the western property line. Trucks will travel along a pre-determined route through NAES Lakehurst and pull along a new railroad track located along Hancock Road.

Note: A railroad track will be extended from across route 547 into NAES Lakehurst, near the commercial gate, along the northern side of Hancock Road for approximately 700 feet into Lakehurst NAES. Hancock Road will be closed to normal traffic for the duration of the project.

- 6.5.3 A 65-ton mobile crane will be used for loading steel intermodal containers on to flat rail cars. An engine may be used to position loaded rail cars and allow for additional loading of empty rail cars without moving the crane.

Transport trucks carrying loaded containers will approach the railhead loading area along Hancock Road and pull alongside the track under the crane. The waste containers will be surveyed for removable and total contamination prior to unloading. At least six direct readings will be taken on the container (each side around the container top seal and two on the bottom of the container) using a hand-held survey meter. After direct surveys, at least two smears will be taken on the container (one near the top seal and one on the bottom) at the locations with the highest direct reading or the locations most likely to be contaminated. See below for actions to take if survey results exceed the limits in Table 3.2.

- 6.5.4 The crane will then lift the container and place it onto a flatbed rail car. Four (4) steel intermodal containers can be placed on each rail car.

After unloading the containers, the truck frame will be surveyed for removable and total contamination. At least two direct readings will be taken on the truck frame using a hand-held survey meter, at locations beneath the container. After direct surveys, at least one smear will be taken at the location with the highest direct reading or the location most likely to be contaminated.

If contamination above the acceptable limits is found on a container or truck, the Duratek Project Manager shall be contacted immediately and operations will be halted. The Duratek Project Manager will contact the Air Force, the Army and the Navy immediately and further action (including clean-up methods) will be coordinated with the appropriate service. If a container is found to be damaged, it will be returned to the BOMARC site, after actions are taken to ensure no material will leak, and the container will not be used for shipping. Leaks around gaskets and seals maybe repaired at the site, with the approval of the Air Force and NAES Lakehurst. The container or the truck will be decontaminated and the spoils placed in a steel container. All spoils and contaminated materials will be returned to the BOMARC site after decontamination is completed. After surveys are completed, the trucks will return to BOMARC through NAES Lakehurst using the same route. The trucks utilized for this project will have the capability to travel through rough terrain (sandy roads).

- 6.5.5 After each rail car is full, the HP Technician, under the supervision of the transportation broker, will conduct the necessary radiological surveys of the intermodal containers in compliance with all DOT requirements and the limits in Table 3.2 of the Work Plan. When the rail cars are full, the rail cars will be removed by Conrail and transported north towards Newark and for final delivery to Envirocare in Utah.
- 6.5.6 Access to the loading area in NAES Lakehurst along the railroad track will be controlled through the use of cones, fencing, and/or barrier tape. Only authorized people can enter the area for unloading activities. A temporary trailer will be located near the loading area where instruments and paper work will be stored. Other temporary facilities and equipment located at NAES Lakehurst rail loading site include portable toilets, drinking water, an air sampler and power supplied from a generator. A design package for the railhead (not included in the Work Plan) provides details about the location of all facilities and equipment.
- 6.5.7 In the event that loaded rail cars remain at NAES Lakehurst

throughout the night, a security guard will be stationed at the rail loading area. He will be provided with a cell phone, and in the event of a problem at the loading site, he will contact the appropriate contractor, Air Force, Fort Dix, and NAES Lakehurst personnel. All security activities will be coordinated with NAES Lakehurst security. In addition, all contractor and subcontractor personnel will obtain NAES Lakehurst passes for the entire duration of the project as required by base security. At no time will the contractor/security guard leave radioactive waste at the railhead or on NAES property unattended.

6.6 Material and Waste Sampling and Analysis

6.6.1 Historical analytical results will be used to prepare a profile for the materials to be shipped to the appropriate disposal facility. Additional samples of excavated materials will be collected as needed during the remedial activities for disposal classification. The detailed procedures for sampling excavated materials are presented in the SAP. The SAP also identifies the anticipated analytical parameters for each waste stream to be sampled. A representative sample of each different waste stream will be collected and analyzed, with the results used to prepare a new waste profile, if necessary, or modify an existing waste profile.

6.6.2 Testing equipment specifications and sampling and analysis procedures to be utilized by personnel are included in the SAP.

NOTE: SAMPLE ANALYSIS IN SUPPORT OF ENVIORCARE WASTE PROFILING MUST BE PERFORMED BY A UTAH APPROVED LABORATORY.

6.7 Material and Waste Packaging

All material and waste scheduled for off-site transportation and disposal will be properly packaged, marked, and surveyed in accordance with all applicable local, State and Federal regulations, including DOT Hazardous Materials Regulations contained in 49 CFR Parts 171 through 180. The Hazardous Material Broker is responsible for ensuring all requirements are met for shipments by public conveyance. All radioactive waste material scheduled for shipment to a disposal site will be packaged in steel intermodal containers for shipment by rail. The following minimum packaging requirements apply for materials to be shipped.

6.7.1 Waste packaging must, at a minimum, meet the applicable requirements contained in 49 CFR 173.24, General Requirements for Packaging and Packages.

- 6.7.2 Containers must be properly sealed, using gaskets or similar devices to prevent leakage of any waste materials.
- 6.7.3 Containers must be reasonably clean. They must not have any waste materials, or gross accumulation of other material that could be mistaken for waste on the outer surface.
- 6.7.4 Containers in a shipment must be properly loaded and blocked and braced securely to prevent shifting and damage during transport. Shippers should examine the specific transport loading requirements contained in 49 CFR 174 for rail and 49 CFR 177 for highway.
- 6.7.5 No waste containers will be opened on NAES Lakehurst property.
- 6.7.6 Railcar beds used to transport containers must be reasonably free of all loose material.
- 6.7.7 Each container that requires labeling must be properly labeled in accordance with the requirements of 49 CFR 172 Subpart E.
- 6.7.8 Each container that requires marking must be properly marked in accordance with the requirements of 49 CFR 172 Subpart D and/or 49 CFR 173.421 and 425.
- 6.7.9 All packaging and preparation of materials for transport from the BOMARC Site or the railhead shall be in strict adherence to the requirements of Reference 2.1 and all other applicable federal, state, local and disposal site regulations.
- 6.7.10 Materials shall be packaged and the packaging inspected in accordance with the requirements of Reference 2.1, Part 173 for the Proper Shipping Name and USDOT Subtype of the material being offered for transport. Any required USNRC approved Type A Packages shall be prepared in accordance with the applicable Certificate of Compliance.
- 6.7.11 The major portion of wastes generated at the BOMARC Missile Site Remediation Project are expected to be less than 2000 pCi/g and, as such, are not Class 7 hazardous material for shipment. If no other USDOT hazard is identified, the materials may be shipped without regard to the Hazardous Materials Regulations of Reference 2.1, in a strong tight steel intermodal container.
- 6.7.12 Wastes with specific radioactivity concentrations greater than 2000 pCi/g will be shipped as Class 7 hazardous material.

Based on preliminary analysis of these materials, the appropriate proper shipping name will be "Radioactive Material, Low Specific Activity, n.o.s." or "Radioactive Material, Surface Contaminated Object, n.o.s.", and must be packaged in steel intermodal containers that meet IP-2 specifications.

- 6.7.13 Any unwanted materials or wastes found to be a hazardous or mixed waste based on characterization data, will be packaged either as Class 7 (Radioactive-LSA or SCO) materials or Class 9 (Hazardous Waste, Solid) materials depending upon its radiological constituents. The materials will also be packaged in steel intermodal containers and manifested from the BOMARC site.
- 6.7.14 All packages offered for transport shall be properly marked and labeled in accordance with the requirements of Reference 1, Part 172 prior to shipment.
- 6.7.15 All hazardous materials (unless otherwise excepted) shall have USDOT hazardous materials shipping papers prepared in accordance with Reference 2.1, Parts 172.200 - 172.205.
- 6.7.16 All hazardous and mixed waste shall, in addition to USDOT hazardous materials shipping papers, have a Uniform Hazardous Waste Manifest selected and prepared in accordance with Reference 2.2, Part 262.20 and Reference 2.8.
- 6.7.17 All radioactive waste shall have a USNRC Uniform Radioactive Waste Manifest prepared in accordance with the requirements of Reference 2.3, Part 20.311.
- 6.7.18 Additional forms shall be prepared as may be required by Federal, State, and Local ordinances, and by receiving site license or acceptance criteria.

6.8 Procedure for Material Loading

With the exception of common carrier shipments of hazardous materials (non-waste shipments) the following procedure shall be followed when loading material into rail cars for transportation. The Broker is responsible for ensuring all requirements are met for material loading.

- 6.8.1 Conduct and document a visual inspection of the conveyance and ensure any discrepancies are repaired prior to loading. This inspection shall include all vehicle safety devices, brakes, and tie-down devices as applicable.

- 6.8.2 The Broker shall inspect all packages as they are loaded to ensure that the packages are in full compliance with all the requirements set forth in this procedure. Incompatible materials shall be segregated as required by Reference 2.1.

NOTE: SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT ALL CONTAINERS USED FOR RADIOACTIVE MATERIAL TRANSPORT ARE COMPLETELY SEALED TO THE MAXIMUM EXTENT PRACTICAL. GASKETS, IF PROVIDED, SHALL BE INTACT AND PROPERLY SEATED. THIS MAY INCLUDE THE USE OF SEALANT ON SEAMS OF METAL BOXES.

- 6.8.3 Upon completion of loading, visually verify that all packages are loaded.
- 6.8.4 Verify the proper use of blocking, bracing, dunnage, and tie-down, as appropriate.
- 6.8.5 Verify the conveyance is properly placarded, as applicable.
- 6.8.6 For radioactive material shipments, perform and document a final contamination and radiation survey of the intermodal containers and ensure that the results are in compliance with the requirements of Reference 2.1.

6.9 Post Loading Requirements

- 6.9.1 The Broker is responsible for ensuring that the following requirements are met.
- 6.9.2 Have the driver (or transporter's representative) and shipper (or shipper's agent, such as a representative of the railroad) sign all required forms including the exclusive use instructions.
- 6.9.3 Review all paperwork to ensure legibility.
- 6.9.4 Copy and distribute paperwork in accordance with the Paperwork Distribution Checklist specified in Reference 2.6, Appendix H. Uniform Hazardous Waste Manifests shall be distributed in accordance with Reference 2.2, Part 262 and as required by the laws of the generating state.
- 6.9.5 Verify that the driver (transporter's representative) understands all special instructions such as the maintenance of exclusive use and prior notification requirements. The shipment may now be released for

transport.

- 6.9.6 Make any required prior notification telephone calls. This might include pre-notifications required by individual states or corrections to information already provided in previous notifications. Mail copies of the Radioactive Shipment Manifest (RSM) cover sheets to the disposal site for radioactive waste shipments, if applicable.

6.10 Material and Waste Labeling and Dating

The Broker is responsible for ensuring that the following requirements are met:

- 6.10.1 Material and waste containers and packages will be marked in accordance with applicable local, State and Federal requirements (49 CFR 172 Subpart D).
- 6.10.2 In addition, a unique identification number will be assigned to each container used for material storage to allow for proper tracking of the material from the time of shipment through off-site disposal and receipt of a certificate of disposal (if applicable). Containers will also be labeled to indicate the type of material they contain, the date of shipment, and the area from which the material originated. The information will be recorded on a Material and Waste Container Management Data Sheet (See Appendix G).
- 6.10.3 The material and waste management database will be periodically reviewed to ensure that no materials are stored on-site while awaiting shipment for a period of time longer than allowed by applicable waste accumulation regulations (90 days for hazardous wastes).

6.11 Material and Waste Transportation and Disposal

- 6.11.1 This section describes the steps for off-site transportation and disposal of material and waste during remedial activities, and is the responsibility of the Broker. Details regarding the on-site loading operations, including material weighing and loading and are provided in the Work Plan. Material and waste disposal summary will be contained in the Material and Waste Disposal Tracking Log, Appendix G.
- 6.11.2 The enroute rail tracking system and format will be available following contract execution with the transportation subcontractor. The transportation subcontractor will provide a daily summary of railcar locations. Based upon the present shipping schedule and material volume estimates, three or

four railcars of radioactive material will be shipped weekly.

- 6.11.3 The transportation route for the trucks from the BOMARC facility to the Lakehurst rail facility where the transportation containers will be loaded onto rail cars is depicted on Drawing 799147-B3 in Appendix F.

The following is a narrative description of the route for trucks hauling waste from the BOMARC site to traverse NAES Lakehurst.

1. Exit east side of BOMARC facility
2. Turn right, south, on Fort Dix gravel and dirt road adjacent to NAES Lakehurst. _

Note: All vehicles should avoid driving over or parking on the AT&T underground cable except in designated locations where protective metal plates or concrete pads have been installed.

3. Enter Route 539 Gate to NAES Lakehurst from Fort Dix
4. Turn right, south, at test area on dirt road
5. Turn left, east, on South Boundary Road
6. Turn right, east, on Taxiway 4
7. Turn right, south, on Broome Road
8. Turn left, northeast, onto Allen Road, cross Taxiway 5
9. Turn right, east, on Rounds Road
10. Turn right, south, at first "Y" on McCord Road
11. Turn left, east, on Houghton Road
12. Turn right, south, on dirt road south of Building 661
13. Turn left, east, on dirt road, cross abandoned runway
14. Turn left, north, on dirt road to Cossville Road
15. Proceed to railhead loading area on north-east side of Hancock Road
16. Trucks pull off on left hand side of Hancock Road at the railhead
17. After unloading, truck returns to BOMARC site via the same route.

NOTE: This route minimizes travel near wetlands, homes, DOD property boundaries, buildings, recreational areas and congested areas. The route avoids travel over bridges.

All access points to the onsite transportation route, such as gates that will be used by the trucks, will be secured in a manner to prevent access by non-authorized personnel or vehicles.

- 6.11.4 All radioactive materials >8 pCi/g excavated during the

remedial activities will be transported to an appropriate, licensed and permitted facility. The radioactive wastes will be disposed of at the Envirocare facility at Clive, Utah.

- 6.11.5 If RCRA Hazardous Wastes are identified during the remedial activities, a licensed hazardous waste hauler will transport them to a permitted hazardous waste disposal facility. Each shipment of waste must be accompanied by a uniform hazardous waste manifest and must be labeled, marked, and placarded in accordance with DOT regulations.
- 6.11.6 Regulated wastes which are not classified as radioactive, RCRA hazardous, or mixed wastes will be transported to an appropriate permitted/licensed disposal facility by a hauler that is licensed to carry the specific type of regulated waste. Materials must be packaged, marked, labeled, and placarded in accordance with DOT regulations. Approval by the Operations Support Command (OSC) is required prior to disposal of these regulated materials and wastes.

Non-contaminated wastes will be transported by a licensed hauler to a permitted municipal waste or construction and demolition debris landfill.

7.0 RECORDS

- 7.1 The broker shall retain copies of records, forms, and shipping papers generated as a result of this procedure until written acknowledgment is received from the consignee for all waste shipments or telephone acknowledgment is received for all non-waste shipments. Notifications and reports shall be in accordance with Reference 2.6.
- 7.2 Copies of shipping papers shall be maintained in the on-site project file for the duration of the project.